

Let us next enquire by what means was the basin of Toronto harbour excavated. In order to solve this problem we must revert to that era when the waters of Lake Ontario were about 350 feet higher than they now are, or when they were nearly on a level with the summit of Queenston Heights.

In illustration of our position I would first draw your attention to those vast masses of sand and gravel which skirt the northern and the western shores of the Lake. It will be sufficient for our present purpose, to confine the field of our examinations to a few miles east and west of Toronto,—beginning at Scarborough Heights, where we find these masses of sand rising to the elevation of nearly 350 feet above the present level of the Lake, at the distance of three or four miles from the Lake, and gradually declining as they approach to the shore. Proceeding northward from the City, by Colonel Wells' house, we perceive exactly the same phenomena, at the same elevations, only the hill upon which his house is built has been acted upon by a current after its first deposition, and is indented, and cut into a steep acclivity, whilst the ground from the hill to the shore is comparatively level, and has been cleared of the sand, and in many places more recent formations have been deposited. Again, if we proceed from the mouth of the Humber in a north west direction, exactly the same phenomena present themselves, at the same elevations—only there depositions of sand have been made, and excavations effected at the lower elevations, even up to the period when the Lake subsided to its present level. Now, it is important to bear in mind that all these mounds of sand and gravel rest upon the tertiary clays, and are a more recent formation; therefore, extensive denudations must have taken place in the basin or bed of Lake Ontario in comparatively recent times; for that the materials which compose these depositions have been excavated from the bed of the Lake is proved by this fact, that nearly all the gravel consists of small rounded boulders or pebbles of Lake stone,—let us enquire into the causes which produced these recent excavations.

We have already shewn that the whole of the waters from the west, including the Mississippi waters, were discharged by the Niagara river, and through Lake Ontario, up to the period Lake Ontario subsided to its present level,—

therefore the quantity of water which flowed through the chasm at Queenston must have been more than double what it is at present.—The highest distinguishable margin at which the waters had continued stationary for a considerable period, after the separation of Lake Erie from Lake Ontario, is 344 feet above the present level of the Lake. When the surface of Lake Ontario was at this elevation, the whole of the discharge from the westward had become concentrated into the present course of the Niagara river. At the first a considerable rapid must have existed at Queenston, which would give to so large a body of water an immense velocity, and would bend the current downward, so as to act upon the bottom of the Lake, and to throw up the materials excavated upon the north shore. But the rocks in the line of the chasm, from Queenston to the whirlpool, are not of a nature to resist for a long period the action of so large and rapid a current of water; therefore a level course would soon have been formed up to the whirlpool, where no doubt the first perpendicular falls were situated; but the narrowness of the chasm and the depth of the current flowing through it would have produced so great a velocity as would have caused the action to be very sensibly felt upon the northern shore of the Lake. However, this does not become so apparent, as we shall see, until the Lake had subsided to a lower level. The next well-defined margin of the Lake is 303 feet above its present level, or a subsidence of 36 feet had taken place, by which the current of the Niagara river must again have assumed a downward bend, and must have again acted upon the bottom of the Lake, and thrown up the materials excavated upon the north shore. This we find to have been the case, for another ridge, formed of the same materials as above described, runs all along the northern shore at this elevation. The next well-defined margin is at the elevation of 280 feet above the present level of the Lake; that the same phenomenon had again taken place, is proved by another ridge of the same description being found upon the northern shore at this elevation. The next well-defined margin is 203 feet above the present level of the Lake, or a subsidence of 72 feet had taken place. This must have given the current a vastly greater power to act upon the bottom of the Lake, than any of the three former subsidences; for the current had